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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,901	11/25/2003	Leonard John Otten III	11732-41335	1185

7590 01/10/2006  
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Albuquerque, NM 87103-1888

EXAMINER
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TURNER, SAMUEL A

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 01/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/723,901	<b>Applicant(s)</b> OTTEN, LEONARD JOHN	
	<b>Examiner</b> Samuel A. Turner	<b>Art Unit</b> 2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claims 6-14, claim 6 is incomplete in that it fails to end with a period.

Claim 15 includes an instrument having a “means to process wavelengths of electromagnetic radiation to produce an interferogram”. The instrument further includes at least one optical path, a means for splitting, and means for spectrally dispersing including a pair of gratings. The “means to process wavelengths of electromagnetic radiation to produce an interferogram” does not meet the 3-prong analysis for to evoke 35 U.S.C. 112, sixth paragraph, applicant must either: (A) amend the claim to include the phrase “means for” or “step for” in accordance with these guidelines; or (B) show that even though the phrase “means for” or “step for” is not used, the claim limitation is written as a function to be performed and does not recite sufficient structure, material, or acts which would preclude application of 35 U.S.C. 112, sixth paragraph. There is no relationship between the means

positioned along the optical path and the means to process and produce. The claim is incomplete in that there is no means or structure claimed to form an interferogram. The claimed phrase “which can interfere” is confusing as there is no claimed interference, which does not appear until claim 30.

Claim 20 adds a second pair of gratings, however the relationship between the second pair of grating and the “means for spectrally dispersing” which includes a pair of gratings is undefined.

In claim 31 there is no antecedent basis for “said second pair of gratings” (antecedent basis for which is found in claim 20) and “said optical path means” (claim 15 refers to “at least one optical path”).

In claim 32 there is no relationship between the “means for spectrally dispersing” which includes the pair of gratings and the “optical means for converging and interfering” which also includes the pair of gratings.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if

Art Unit: 2877

the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15, 16, and 23 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Meigs(6,687,007).

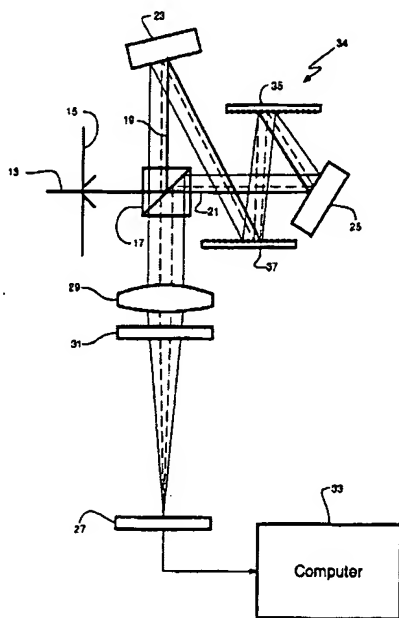


Figure 2

With regard to claim 15, Meigs teaches a Sagnac type interferometer comprising:

at least one optical path(from the aperture 15 to the detector 27),

means positioned along said optical path for splitting said wavelengths into reflected and transmitted portions of said optical path(17), and

means positioned along said optical path for spectrally dispersing said wavelengths(36,37),

said means for spectrally dispersing and said means for splitting producing first and second sets of spectrally dispersed beams which can interfere with each other to produce a plurality of different fringes of different wavelengths,

said means for dispersing said wavelengths including a pair of gratings.

As to claim 16, wherein said gratings are reflective(36,37).

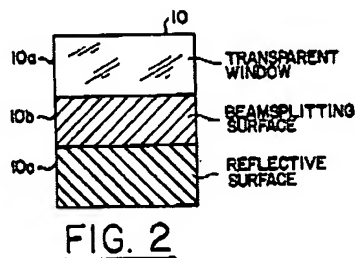
As to claim 23, wherein said means for splitting includes a beam splitter(17) positioned along said optical path for splitting said optical path into first and second optical path portions.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schindler(4,181,440).



With regard to claim 1, Schindler teaches a beam splitter for splitting wavelengths of electromagnetic radiation comprising:

an optically transmissive element(10) having first and second surfaces, said first surface being divided into first, second and third zones(10a-10c, column 3, lines3+),

said first zone(10c) having a first coating which, for said wavelengths, is substantially 100% reflective,

said second zone(10b) having a second coating which, for said wavelengths, is partially transmissive and partially reflective,

said third zone(10a) being substantially 100% transmissive,

said second zone being between said first and said third zone(see figure 2).

Note that Schindler fails to teach the third zone having an anti-reflective coating.

As to claim 2, wherein said second surface has no anti-reflective coatings(10b, column 3, lines3+).

As to claim 3, Schindler fails to teach wherein said second surface has an anti-reflective coating.

As to claim 4, wherein said second coating is, approximately, 50% reflective and 50% transmissive(10b, column 3, lines3+).

As to claim 5, wherein said first and second surfaces are parallel to each other(10).

Official notice is taken that anti-reflection coatings are known in the art to reduce unwanted specular reflections. See In re Malcom, 1942 C.D 589; 543 O.G. 440.

If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the next Office action will indicate that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made modify the Schindler apparatus by adding an anti-reflection coating to the transparent window (claim 1), and the beam-splitter (claim 3) in order to reduce any specular reflection at the air-to-surface boundary of the beam-splitter 10.

Claims 15-19, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nettleton(GB-2 317 446).

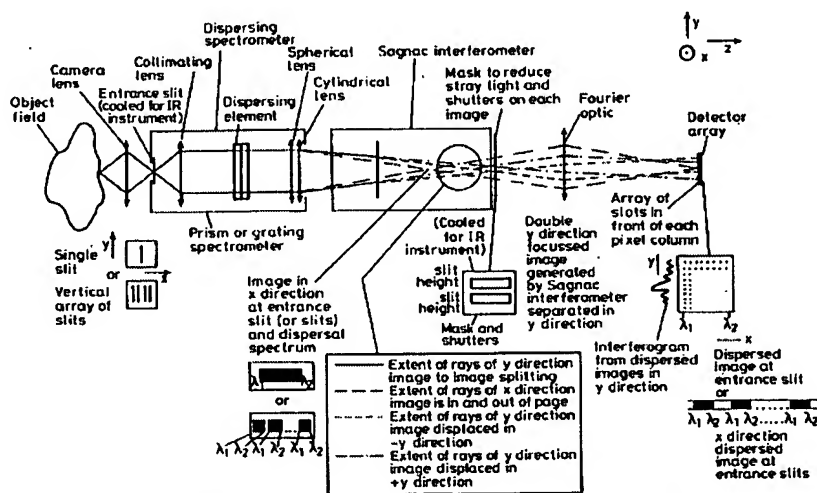


Figure 3 Schematic diagram of 2 dimensional detector array high resolution spectrometer. Lenses could be mirrors. Image positions could vary, only example given. In practice components change direction of central ray, not shown



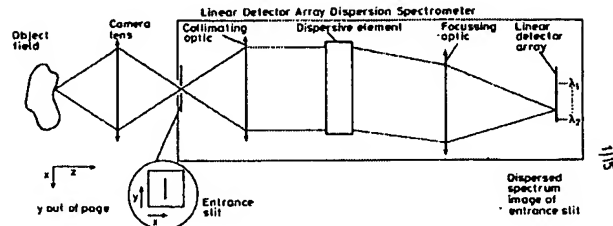


Figure 1 Dispersive Spectrometer

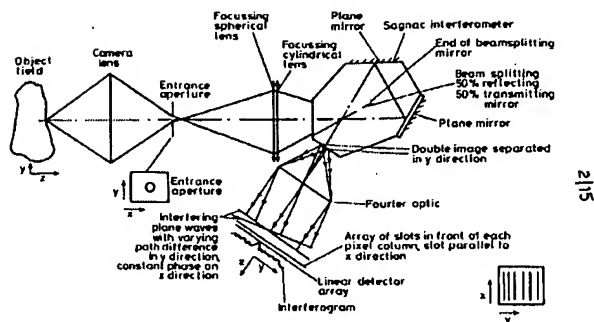


Figure 2 Sagnac Interferometer Fourier Transform Spectrometer

With regard to claim 15, Nettleton teaches a dispersive Sagnac spectrometer comprising:

at least one optical path(from slit to detector array; figure 3),

means positioned along said optical path for splitting said wavelengths into reflected and transmitted portions of said optical path(beamsplitting mirror, figure 2), and

means positioned along said optical path for spectrally dispersing said wavelengths(dispersive element; figure 1),

said means for spectrally dispersing and said means for splitting producing first and second sets of spectrally dispersed beams which can interfere with each other to produce a plurality of different fringes of different wavelengths. Note that Nettleton fails to teach a means for dispersing which includes a pair of gratings.

As to claim 16, Nettleton fails to teach wherein said gratings are reflective.

As to claim 17 Nettleton teaches positioning the dispersive element before the means for splitting(dispersive element; figure 3).

As to claim 18, Nettleton fails to teach wherein said gratings are positioned along said optical path in optical series with each other.

As to claim 19, Nettleton teaches an aperture positioned along said optical path before the dispersing element(slit; figure 3).

As to claim 23, Nettleton teaches wherein said means for splitting includes a beam splitter positioned along said optical path for splitting said optical path into first and second optical path portions(beamsplitting mirror, figure 2).

With regard to claims 15-19, and 23, the only difference between the claims and the teaching of Nettleton is the dispersing element which in Nettleton is either a prism or grating(page 4, line 12) and shown as transmissive, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Nettleton apparatus by replacing the transmissive grating with a pair of reflective gratings because increasing the number of gratings increases the dispersion and a transmission grating system is optically the same as a reflection grating system. It has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being obvious over Soliz et al(2004/0085542) which has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is

thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

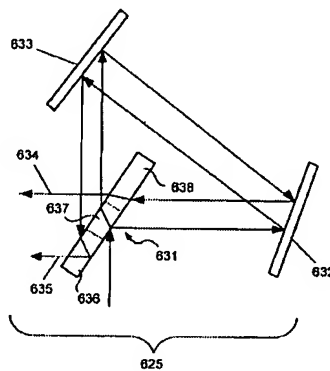


FIG. 6

With regard to claim 1 Soliz et al teach a beam splitter for splitting wavelengths of electromagnetic radiation comprising:

an optically transmissive element(631) having first and second surfaces, said first surface being divided into first(636), second(637) and third(638) zones,

said first zone having a first coating which, for said wavelengths, is substantially 100% reflective(636),

said second zone having a second coating which, for said wavelengths, is partially transmissive and partially reflective(637),

said third zone being substantially 100% transmissive(638),

said second zone being between said first and said third zone(see figure 6).

Soliz et al fail to teach a third zone having an anti-reflective coating.

As to claim 2, Soliz et al teach wherein said second surface has no anti-reflective coatings.

As to claim 3, Soliz et al fail to teach wherein said second surface has an anti-reflective coating.

As to claim 4, Soliz et al teach wherein said second coating is, approximately, 50% reflective and 50% transmissive(637, paragraph [0058]).

As to claim 5, wherein said first and second surfaces are parallel to each other(631).

With regard to claim 6, Soliz et al teach a high efficiency Sagnac spectrometer comprising:

a) a beam splitter(631), said beam splitter including an optically transmissive element having first and second surfaces, said first surface having first(636), second(637) and third(638) zones

i) said first zone having a first coating which, for said wavelengths, is substantially 100% reflective(636),

ii) said second zone having a second coating which, for said wavelengths, divides said wavelengths into a reflected portion and a transmitted portion(637), and

iii) said third zone being transmissive(638);

b) means for directing said wavelengths upon said second zone(paragraph [0057]); and

c) first and second reflective means(632,633), said first and second reflective means being positioned relative to each other and said beam splitter such that,

i) said portion of said wavelengths reflected off said second zone is then reflected off said first reflective means, then reflected off said second reflective means, and then reflected off said first zone, and

ii) said portion of said wavelengths transmitted through said second zone is then reflected off said second reflective surface, then reflected off said first reflective surface, and then through said third zone(see figure 6). Soliz et al fail to teach where said third zone has a transmissive coating.

As to claim 7, wherein said second zone is between said first and said third zone(see figure 6).

As to claim 8, wherein said first and second reflective means are, respectively, first and second reflective surfaces(632,633).

As to claim 9, wherein said second coating is, approximately, 50% reflective and 50% transmissive(637, paragraph [0058]).

As to claim 10, wherein said first and second surfaces are parallel(631).

The only difference between the teachings of Soliz et al and the claimed invention is the limitation to an anti-reflection coating on the second and third zones. It would have been obvious to one of ordinary skill in the art at the time the

invention was made modify the Soliz apparatus by adding an anti-reflection coating to the transparent window (claims 1 and 6), and the beam-splitter (claim 3) in order to reduce any specular reflection at the air-to-surface boundary of the beam-splitter 631.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soliz et al(2004/0085542) as applied to claims 1-10 above, and further in view of Nettleton(GB-2 317 446).

As to claim 11, Soliz et al fail to teach, wherein said reflected(634) and transmitted(635) beam are diverging beams, but does teach optical means for converging and interfering both said transmitted portion and said reflected portion of said wavelengths after said reflected portion of said wavelengths has been reflected off said first coating and said transmitted portion of said wavelengths has been transmitted through said third zone(paragraph [0057]).

As to claim 12, wherein said means for converging includes a Fourier lens(paragraph [0030]).

As to claim 13, wherein said means for converging further includes a cylindrical lens(paragraph [0030]).

As to claim 14, further including a detector sensitive to said wavelengths, said detector positioned at the location where said reflected portion of said wavelengths and said transmitted portion of said wavelengths interfere with each other(paragraph [0059]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Soliz et al apparatus by placing a dispersing element before the input to the Sagnac interferometer of Soliz, thus forming the claimed divergent beams, since this would produce a system having the benefits of both a dispersive spectrometer and a Sagnac spectrometer(see pages 12-13 of Nettleton), and the high efficiency Sagnac spectrometer taught by Soliz et al.

Claims 24-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nettleton(GB-2 317 446) as applied to claims 15-19, and 23 above, and further in view of Soliz et al(2004/0085542).

With regard to claims 24-29, Nettleton fails to teach the three zone beam-splitter which produces a high efficiency Sagnac spectrometer.

Soliz et al teach a high efficiency Sagnac spectrometer having all the claimed limitations save for the anti-reflection coatings of claim 24 and claim 26. See the rejection of claims 1-10 above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the Sagnac interferometer found in Nettleton with the high efficiency Sagnac spectrometer of Soliz et al. This would provide Nettleton with a Sagnac spectrometer having a 100% beam throughput, see paragraph [0058] of Soliz et al.

With regard to claim 30, Nettleton fails to teach wherein said reflected and transmitted beams constitute diverging beams, but does teach an optical means for

converging and interfering both said transmitted and reflected beams(Fourier optics, figure 3).

The beams are convergent when split by the Sagnac spectrometer beam splitter of Nettleton due to the input optics arrangement and the field of view of the Sagnac spectrometer. Note, in Soliz the input optics arrangement and the field of view of the Sagnac spectrometer provide collimated beams. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Nettleton apparatus by placing the Sagnac spectrometer further from the input optics(the spherical and cylindrical lenses, figure 3) such that the input beam is divergent but still within the field of view of the high efficiency Sagnac spectrometer, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.



Art Unit: 2877

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is 571-272-2432.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on 571-272-2800 ext. 77.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Samuel A. Turner', with a stylized flourish at the end.

Samuel A. Turner  
Primary Examiner  
Art Unit 2877